

# Vero Speaker Mod

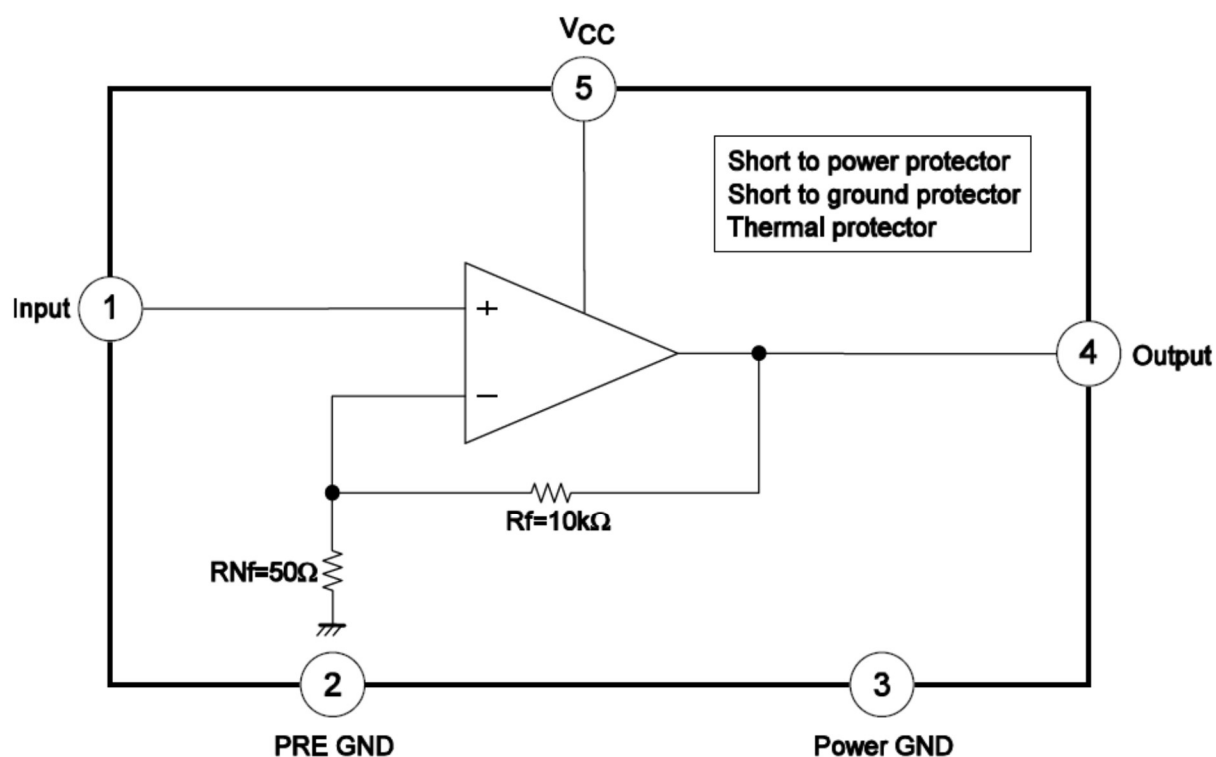
I've had the Vero VR-N7500 radio for over a year now. I chose it because of the "headless" feature. I didn't want to drill into my new car dashboard and wanted a stealthy installation.

My problem is with the audio. The radio does not have a speaker except for the one in the included speaker/mic. But the audio is poor. There is a 3.5mm jack on back but the manual makes no mention of it. I connected a speaker to it and it is super-loud/distorted even at the lowest volume setting. Viewed on an oscilloscope the output is distorted and clipping. My conclusion is the audio output is a botched design so Vero decided not to mention it in the manual. I decided I had to mod the radio.

Consider carefully before proceeding. It requires some solder skills. It may void your radio warranty and there's always the chance you could break the radio somehow.

## The Mod

The radio uses a Sanyo LA4225 audio IC to drive the rear speaker jack. But Vero screwed up. The LA4225 has about 45 dB gain which is too much for their drive level. There is no gain adjust on the IC. My mod is to attenuate the input to the IC.

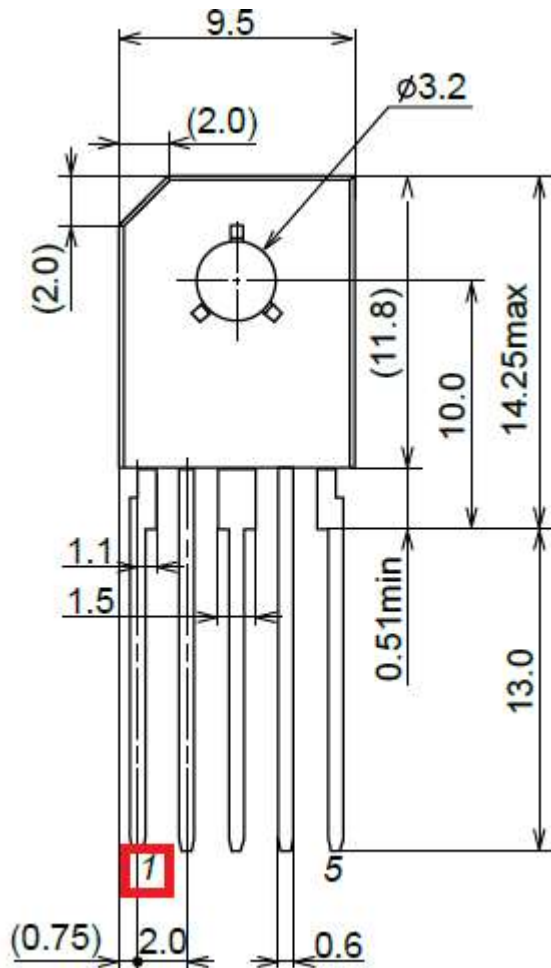


## Procedure

1. Open the radio top cover by removing the four Phillips screws.
2. Viewed from the front, the LA4225 IC is in the rear left-hand corner (circled blue, below).



3. The LA4225 IC has five pins soldered to the board. You need to lift pin 1. I used a dental probe with a hook-end to get under the pin while I heated it with the soldering iron and it lifted right up.



4. With pin 1 lifted, use pliers to bend the pin straight upward.
5. We are going to add a series resistor to pin 1. The datasheet says the IC has 50K input impedance. Based on measurements, the input signal needs about 32 dB attenuation. I added a 2.6 Meg $\Omega$  series resistor. The input attenuation is thus about 34 dB.
 
$$20 \cdot \log[50k/(50k+2.6M)] = -34 \text{ dB}$$
 You can try other values, depending on your speaker setup.
6. Form the resistor to go between the pin and the pad. Make a short foot to connect to the pad. Bend the lead on the other end around so it will connect to the IC pin. I used an axial resistor. An SMT resistor might fit here nicely instead, if you have one available. (side-view, below)



7. You may have to tip the resistor to one side so it doesn't touch the top cover.

8. With the mod the audio output is strong and clear into my 8 Ω Motorola speaker.

The Vero VR-N7500 is a unique radio. My opinion of it is mixed. Besides the speaker problem. The manual is terrible and the app is confusing. The Android app appears much better with more features. Unfortunately, I am using the IOS app which is pretty bare bones. I haven't seen the IOS app getting updates. It supports a version of APRS which is a nice feature.

I was hoping the radio would sync with my car's console display, but I haven't got that to work. If Vero could get their radio to connect to the car's console and audio system they would have a real winner.

I use the USB mic, which works fine if you overlook that it talks to you in Chinese. I miss having a volume knob and the frequency display. Having to tap through the app while driving is not convenient. But that is the choice you make when you go headless.

I will try it for a while with the speaker mod. I may eventually go with another radio.